REMARKS

In the October 9, 2007 Office Action, the Examiner rejected claims 1-13 under 35 U.S.C. § 103(a) as being unpatentable over Meaney (2002/0068865) in view of Prince (6,230,041). Applicants express no opinion as to the merits of the rejection, but have amended the claim set and submit that for at least the reasons provided below, the pending claims are patentable over the art of record.

Claim 1 as amended specifies that the medical data processor analyzes in real time the behavior of the agent in the subject. Further it indicates that the protocol controller adjusts the parameters in real time of the data acquisition process in response to the analyzed real time behavior of the agent in the subject. The prior art of Meaney and Prince do not disclose these features, either alone or in combination, and thus, the invention is patentable over them.

Meaney is directed to a system for imaging vascular anatomy, and it provides a method of imaging the vascular anatomy over a region that is considerably greater than the field of view of a normal magnetic resonance imaging coil. The aim is to achieve a larger image, but still with a single contrast agent injection. In Meaney this is achieved by making the single contrast agent injection into a vein rather than an artery (thus avoiding the risks of arterial injury mentioned in paragraph [0005]), and timing the acquisition of the images to coincide with the arrival of contrast agent at the region of interest. Where the region of interest is larger than the field of view, the patient is moved by moving the patient's table, again this being timed in relation to the expected arrival of contrast agent at the relevant area. This is explained in paragraphs [0048] to paragraph [0051] of Meaney.

In order to synchronize the imaging process with the arrival of a contrast agent in the region of interest in the patient (the patient may have been moved to image different regions at different times) paragraphs [0061] to [0065] explain that it is possible to detect the arrival of contrast agent in the region of interest by applying magnetic pulses and detecting a "*characteristic change in the response from the region of interest to the magnetic resonance pulses.*"

Paragraph [0062] explains that this is a characteristic change in the radio frequency signal emitted from the region of interest (see last two sentences). Upon detection in this way the detection system 34 instructs the imaging controller 12 to initiate collection of image data of the (first) image volume. In an alternative embodiment mentioned in paragraph [0068] that the operator observes the change in the shape of the radio frequency signal envelope and himself instructs the imaging system to initiate the imaging sequence.

It is important to note, though, that the imaging sequence is not thereafter adapted or changed depending on what is seen in the image. It is simply the start of the pre-programmed imaging sequence that is timed in relation to the arrival of contrast agent. Thus, there is no real time analysis of the image data, this being followed by an adjustment of the imaging parameters based on that analysis of the imaged data. In Meaney it is simply a question of when to start the imaging process.

Prince also lacks disclosure of the adjustment in real time of data acquisition parameters based on a real time analysis of the behavior of the agent in the subject. Prince again is concerned with the relative timing of infusion of contrast agent and imaging but the imaging process is a normal pre-programmed imaging process and it is simply started at a certain time after administration of contrast agent, with this timing being estimated based on knowledge of how the contrast agent travels through the body, see for example column 8, lines 38 to 56 and column 9, lines 20 to 25 which say:

> *in another preferred embodiment, the timing of the maximum or substantially elevated infusion rate may be further selected or controlled, based on the location of the artery of the interest relative to the injection site and/or the patient's heart ....*

Column 19 at lines 28 to 32 refer to a pre-programmed infusion rate or sequence, and column 20, lines 33 to 35 refer to the use of a spring that is designed to apply a variable force on the plunger infusing the contrast agent. Column 22, lines 63 to 65 refer to a pre-programmed infusion rate.

Thus, Prince does not provide any automatic control of the parameters of an imaging process based on what is seen in the image. The examples in Prince from column 26 to column 30 clearly disclose that in most cases the contrast agent infusion is done manually, timed manually in relation to a normal MRI scan.

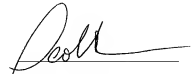
Therefore, neither Meaney nor Prince discloses the feature of adjusting the parameters in real time of a data acquisition process in response to the analyzed real time behavior of the agent in the subject. This requires a feedback in the data acquisition process itself, together with action based on that feedback. As illustrated in the CT liver imaging example of the present invention the liver is imaged every two or three seconds to detect the arrival of contrast agent at the area of interest, and then the image acquisition protocol is changed to obtain the required slice images. Thus, it is a change in the imaging process itself, based on analysis of the image. In the MR breast imaging example of the invention there is an initial image acquisition that can give certain information (such as T1 values) and then on injection of the contrast agent a rapid echo planar (EPI) image sequence is used until the contrast-induced intensity reaches a particular value, and then the image parameters are changed again to use a slower, high resolution gradient echo sequence. Thus, again in the breast-imaging example it is the parameters of the imaging process itself that are changed based on what is seen in the image data.

Based on the foregoing Applicants respectfully submit that claim 1 as amended is patentably distinguished over the cited prior art. For at least the reasons that claim 1 is patentable over the art of record claims 2 to 12 are also allowable as dependent from an allowable base claim.

Authorization is provided to charge Deposit Account No. 11-0171 for both the fee for a two-month extension of time and the fee to consider the accompanying information disclosure statement and art cited therein. No additional fee is believed to be due with respect to filing this amendment. If any additional fees are due, or an overpayment has been made, please charge, or credit, Deposit Account No. 11-0171 for such sum.

If the Examiner has any questions regarding the present application, the Examiner is cordially invited to contact Applicants' attorney at the telephone number provided below.

Respectfully submitted,



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